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Academy cadet seeks higher learning in ML laboratory

by Pete Meltzer, Jr., Materials and Manufacturing Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – Cadet First Class Scott B. McCusker, a senior at the academy majoring in biochemistry, is one of 14 Air Force Academy cadets completing up to six weeks of real world training as part of the Cadet Summer Research Program.

McCusker has been working alongside engineers and scientists in the Air Force Research Laboratory's Materials and Manufacturing Directorate since May 16. He has been working in the directorate's Survivability and Sensor Materials Division for Morley Stone, conducting laboratory research on various types of proteins that may help the Air Force design and develop better sensors to support the warfighter.

McCusker has been working with a protein that senses mechanical stress called MscL. Stone indicated that in previous work, research has shown that this protein can also be triggered by thermal energy, the type of energy found in the infrared region of the electromagnetic spectrum.

"Cadet McCusker has been instrumental in helping us create what is called a "fusion" protein, because we take two different proteins and fuse them into one," Stone stated.

According to Stone, the work allows for the scientists to tie together sensitive sensing systems found in nature with the optical readouts used in artificial systems. The overall goal is to have this work lead to new types of sensors that are part biological and part synthetic.

"Cadets like Scott bring a fresh perspective to the lab," said Stone. "They have read in their textbooks about the things we are doing in the lab, but they have never seen the equipment that makes this possible, or actually experienced the scientific process of doing research."

"You can see them grow in their capabilities and confidence just the short time they are here," he added.

A native of Little Rock, Ark., McCusker spent 10 years in Salt Lake City, Utah before entering the academy in 1998. When not studying, McCusker enjoys rock climbing and skiing. He's also a sport parachutist with 455 jumps under his belt.

McCusker's parents, Kevin and Barbara, are both medical doctors in the Salt Lake City area. McCusker hopes to be a surgeon



EXPERIMENTATION — Cadet McCusker is preparing to spread-plate cells that contain the protein he has been working with during his lab rotation.

in the Air Force and recently applied for admission to Johns Hopkins University School of Medicine.

"I want to practice medicine in the Air Force," McCusker explained. "I want to serve and provide the high quality of medical service Air Force people deserve."

"This has been a great opportunity to see the Air Force," McCusker added. "The people here are very good at what they do. I've been really impressed with this experience." @